CLAIMS

What is claimed is:

1. An optical logic gate, comprising:

a laser light source having an optical output having a first wavelength;

a first coupler having a first optical input receiving a first optical signal and a second optical input receiving a second optical signal; and generating an output comprising a portion of said first optical signal and said second optical signal;

a second coupler having a first optical input receiving a said output of said laser light source and a second optical input receiving said output from said first coupler and generating a third optical sighal; and

a multiple quantum well semiconductor optical amplfiier receiving said third optical signal and generating an optical signal that is the logical NOR of said first optical input and said second optical input.